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ABSTRACT

The creation and validation of a Spanish version of an English developmental spelling test (DST) is described. An introductory section reviews related literature on the rationale for and construction of DSTs, spelling development in the early grades, and Spanish-English bilingual education. Differences between the English and Spanish test versions are then outlined, and the scoring system is explained. The research methodology and results are then described. Subjects were 80 students in kindergarten and first and second grade, all native Spanish-speaking limited-English-speakers enrolled in a transitional bilingual education program in which literacy is taught first in the native language. Thirty of the kindergarten subjects participated in a follow-up study a year later. The DST was administered in conjunction with measures of letter knowledge, concept of word, word reading, and reading comprehension. Results show DST scores to be strongly related to the reading measures and quite similar to results found with English DSTs. The Spanish DST was found to be easy to administer and high in internal consistency and interrater reliability. Uses for a DST in planning instruction, placement and grouping decisions, and measuring growth are discussed. Test results are appended. (Contains 28 references.) (MSE)

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Validating a Spanish Developmental Spelling Test

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Running Head: SPANISH DEVELOPMENTAL SPELLING TEST

Abstract

This study created and attempted to validate a Spanish version of a developmental spelling test (DST). The DST was administered in conjunction with measures of letter knowledge, concept of word, word reading, and reading comprehension to kindergarten, first, and second graders (n = 80) and followed-up with first graders (n = 30) one year later. The subjects were enrolled in a bilingual program in which students are first taught reading in their native language. DST scores are found to be strongly related to the reading measures and quite similar to results found with English DST's. The DST was easy to administer and high in internal consistency and inter-rater reliability. Uses for a DST are discussed that concern planning instruction, placement and grouping decisions, and measuring growth. The DST scoring procedures provide a framework for analyzing spellings in naturally occuring text.

Validating a Spanish Developmental Spelling Test

Bilingual programs vary as to their focus on language of instruction and to the amount of time in which instruction is provided in the child's native language (L_1). The transitional bilingual model is one in which instruction is initially presented in L_1. As students gain proficiency in English (L_2) instructional time in L_2 is increased. One purpose of providing native language reading instruction in the transitional model is to facilitate students' subsequent learning to read in English and for eventual transition into classrooms where instruction is presented exclusively in English. Given this objective, transitional bilingual programs need to be especially concerned with measuring the growth of their primary grade children -- those reading in their first language.

The instructional and test materials market for teaching reading to students in the United States whose native language is Spanish is no doubt growing. Nevertheless, it is small by comparison to the breadth of choices that fill the reading materials market in English. As a result, teachers in schools where bilingual programs begin reading instruction in Spanish can discover that they have few choices when they search for good assessment instruments.

One assessment that might be quite useful is a developmental spelling test (DST) -- a relatively simple test that provides an

index of a child's word knowledge (Henderson, Estes, & Stonecash 1972). DSTs are based on a thorough body of research on the emergent spelling ability of young children (Beers, Beers, & Grant, 1977; Beers & Henderson, 1977, 1980; Gentry, 1978, 1982; Henderson, 1981; Morris & Perney, 1984; Read, 1971; Zutell, 1979). However, they are used not just by researchers but by teachers as well. It is becoming standard fare for textbooks concerned with the How-To's of teaching beginning reading to include DST's (Henderson, 1981; Gillet & Templeton, 1982; Temple, Nathan, & Burris, 1982).

Some elements of the articulatory basis of children's "invented spellings" have been shown to extend to Spanish (Hudelson, 1981-82; Temple, 1979). At the same time, the similarities and differences in spelling in English and Spanish have not been worked out with such detail that a solid research basis is provided for a Spanish version of a DST. So, based on the research in developmental spelling in English and building upon research that has begun to classify children's invented spellings in Spanish (Hudelson, 1981-82), a Spanish version of a DST and a corresponding scoring system were constructed. The purpose of this investigation was to validate the Spanish DST by determining its relationship to reading ability and comparing that to the results found in the literature on DST's in English.

CONCEPTUAL FRAMEWORK

Developmental spelling research was initiated by Read's (1971) examination of young children's "invented" spellings. Read identified the linguistic bases of these spellings and showed that the children's productions were, indeed, thoughtful and strategic. The youngsters were using what they knew about letter names and they reasoned out spellings according to how the sounds within words are pronounced. That is, when they couldn't match a sound directly to a letter name, they categorized sounds by their articulatory features.

Building upon Read's work, Henderson (Henderson, Estes, & Stonecash, 1972) hypothesized a model of word knowledge acquisition in which children pass through successive developmental stages. In this view children adopt spelling strategies that are useful at one time but which are later abandoned in favor of more informed strategies that reflect increasing knowledge about how English spelling works. Beers and Henderson (1977) examined writing samples that were collected at regular intervals throughout first grade. They documented that children moved through a series of stages indicated by changes in the strategies they used in spelling vowels. They noted that children moved through these spelling stages at different rates but that the spelling pattern sequences are generally invariant regardless of the time that the child begins to learn to write.

Eventually, Gentry (1978, 1982) summarized these patterns of spelling strategies into five stages -- precommunicative (referred to as "prelíterate" in this study), semiphonetic, phonetic, transitional, and correct. He reported a relationship between the children's spelling stages and their reading achievement scores. Morris and Perney (1984) further delineated the semiphonetic stage in constructing a DST that could be used with first-semester first graders. In confirming the relationship between reading ability and a student's spelling strategy, they found that a DST score from January of first grade was a significant predictor of end of year reading achievement.

Subsequent research has attempted to identify other abilities that are related to spelling development. Wordness, or concept of word, refers to a child's understanding of the match between spoken words and the boundaries of printed words and seems to be strongly correlated to spelling ability. Morris (1983) found that children with a poorly developed concept of word were seldom able to represent more than beginning consonants in their spellings. Children with a rudimentary knowledge of the word concept generally represented beginning and ending consonants but rarely vowels. Those with a well developed concept of word consistently spelled at the phonetic stage by mapping out consonants and vowels.

Ferroli and Shanahan (1987) administered a DST in conjunction with other measures of emergent literacy to the same children twice in kindergarten and again at the end of first grade. They showed that even when administered in kindergarten a DST score significantly predicts reading ability by reporting correlations between the DST scores and reading achievement at the end of first grade that ranged from .59 to .67 ($p < .01$). By multiple regression analysis they examined the relationship between spelling and the emergent literacy measures. In March of kindergarten the DST scores were most highly associated with the children's knowledge about print and letters (Concept of Word and Letter Production). At the end of kindergarten the spelling scores were best predicted solely by scores on a measure of phonemic awareness. At the end of first grade phonemic awareness continued to be associated with the spelling score, but by this point reading achievement and spelling ability overlapped to such an extent that each was the best predictor of the other.

Spelling development in kindergarten and first grade, then, is characterized as being influenced by changes in the child's letter knowledge, wordness, phonemic awareness, and reading ability. A central issue in this study is that such a characterization ought to apply equally well to children's spelling in Spanish or in any alphabetic language. Gill (1979) studied French speaking children and showed that their spelling

errors were analyzable according to the theory provided by research in English. Stever (1980) used a sample of children who spoke a southern American English dialect and concluded that spelling strategies do generalize across dialects, but that at the time that children are spelling phonetically, their written productions do reflect the influence of non-standard pronunciations.

Some research has shown that spelling development in Spanish proceeds much as it does in English. Temple (1979) confirmed that Spanish-reading children produce invented spellings very systematically. Other than showing more variance in spelling consonants, Temple's subjects seemed to make generalizations similar to those of their English-reading counterparts. His first and second graders used knowledge of letter names in their early spelling efforts. When they were unable to match the desired sound to a letter name, these Spanish-reading children, Temple reports, also categorized sounds according to articulatory features. Hudelson (1981-82) collected samples of original compositions from 10 first and 10 second graders from March through May. She categorized spellings in terms of the different strategies that children seemed to be using. These children, too, were using more than letter sound knowledge. They used knowledge of letter names, and they categorized sounds by articulatory features. Hudelson even concluded that this research with

Spanish-speaking children "suggests that there might be some universals in the development of spelling strategies, at least in alphabetic languages." At the same time Hudelson (1981-82), like Temple (1979), found, in direct contrast to Read (1975), that children's Spanish spellings show more deviations among consonants while vowel spellings were more consistent. Temple attributed this to more ambiguity among Spanish consonants while Hudelson suggested that it's because Spanish vowels are more regular and perceptible.

This body of research on English developmental spelling and the preliminary analyses of children's invented spellings in Spanish, taken together, give support to the feasibility of constructing a DST in Spanish. These studies also point out some contrasts between English and Spanish orthographies that need to be considered in extrapolating the scoring of a DST in English to one in Spanish.

RATIONALE FOR THE SCORING SYSTEM

If spelling in Spanish and English proceeds in a similar manner, then the general principles that underlie the scoring of an English DST should extend to scoring such an instrument in Spanish. At the same time some important differences exist between the English and Spanish orthographies that preclude directly applying the specific features of the scoring system from one language to the other. The following rationale works from

Morris and Perney's (1984) criteria for scoring a DST in English and attempts to resolve the differences encountered when applying them to Spanish.

To score one point in English (semiphonetic stage) the initial consonant must be represented. One reason for emphasizing consonants in scoring is that they appear to be more salient than vowels. Mayhew (1977) found that consonants appear earlier than vowels in English children's spellings. Certainly the body of research on the variety of vowel substitutions children use in English spelling (Beers & Beers, 1980; Beers, Beers, & Grant, 1977; Beers & Henderson, 1977; Fisher, 1974; Gerritz, 1975;) indicates that consonants are more stable. In contrast, Hudelson (1981-82) found that Spanish-speaking children's spellings showed more deviations among consonants while vowel spellings were more regular.

In response to the greater perceptibility of vowels the Spanish DST puts equal emphasis on vowels and consonants. One point is assigned when the first letter written by the child represents either the initial consonant or the vowel of the first syllable of the target word. (See Figure 1.)

Insert Figure 1 about here

The vowels raise yet another important difference between the English and Spanish scoring systems. In English there are certain "acceptable substitutions" which are based on similarities in how vowel sounds are articulated. That is, children at the semiphonetic and phonetic stages are allowed to substitute the letter name that is nearest in place of articulation in the vocal cavity to each "short" vowel. Thus, A can be substituted for short e ("test" = TAST) and E can be substituted for short i ("stick" = STEK). In Spanish, however, vowels are more stable as each one represents a single sound. Further, as the vowel sound and the letter name are the same in Spanish they use the same place of articulation. As a result, the Spanish scoring system requires that all single vowels be spelled correctly. No vowel substitutions are permitted.

Unlike the vowels, there are several consonant substitutions that are acceptable in the Spanish scoring system. B and V may be interchanged as for most Spanish speakers these are both pronounced /b/. J may be substituted for G as in some words both letters represent /h/. S, C, and Z are accepted for spelling the sound /s/. N~, RR, and LL may be represented, respectively, by N, R, and Y as the child searching the alphabet for a way to represent one phoneme (/n/, for example) can find it within more than one letter name (both N~ and N in this case). Finally, QU may be spelled with K or C.

Semiphonetic2 stage spelling accounts for greater ability in phonemic segmentation. Such spellings are still abbreviated in that several sounds are omitted. In English, two point scores take the form of representing either the consonant boundaries of a word or the initial consonant and the first vowel. Allowing for the consonant substitutions listed above and accepting only correct vowels the Spanish DST assigns two points for representing a) the initial consonant and another consonant in the target word or b) the initial consonant and the first vowel or c) the initial vowel and one subsequent consonant.

A phonetic stage speller produces a nearly complete phonetic map of the word. In English a three point spelling is permitted the following omissions: a nasal before a consonant, the second letter of an initial consonant pair or the first letter of a final consonant pair, and the vowel letter in the unstressed syllable of a two syllable word. This last issue of two syllable words raises another difference.

English DSTs have used very few polysyllabic words for primary grade students whereas Spanish words are made up of more but shorter syllables than English.[1] This difference in syllable length made it necessary for the scoring system for the Spanish DST to focus directly on polysyllabic words.

The only provisions for scoring polysyllabic words in the English system allows phonetic stage spellers to omit the vowel in

the unstressed syllable while the transitional stage speller is required to include a vowel in the unstressed syllable. The justification for allowing this omission is that in spoken English vowel sounds in unstressed syllables are often "reduced," or pronounced with a schwa sound. However, Spanish syllables are pronounced with nearly equal stress. Thus, Spanish scoring cannot allow vowel omissions or errors where the English scoring can.

It was determined, then, to focus directly on the syllable at the phonetic stage. The scoring system used in this study defines a phonetic map (three points) as one which accounts for each syllable in a word by correctly spelling its vowel.

A transitional stage (four point) score is by far the most problematic to extrapolate from English to Spanish. At this stage children demonstrate that they know that spelling is not a simple matter of phonetic mapping. They show knowledge of orthography by using a visual or morphemic strategy in their spellings. In the English scoring system one indicator of this sort of knowledge is including nasals (M and N) before consonants. But in Spanish preconsonantal nasals are somewhat more noticeable in speech because they tend to occur at syllable boundaries. As a result, spelling them does not necessarily indicate "orthographic" knowledge -- a good phonetic stage speller should include them.

There are three other indicators for showing orthographic knowledge in English that are not applicable to Spanish. The

English transitional stage speller employs "vowel markers" and demonstrates that "long" vowel sounds are spelled by using a second vowel letter. In Spanish all vowels are sounded. Further, English transitional stage spellers use short vowels correctly (as opposed to using letter name substitutions) and include a vowel letter in even the unstressed syllable in two syllable words. Spanish, however, shows less vowel reduction (Hudelson, 1981-82; Temple, 1979) and children are expected to account for all vowels and account for them correctly at an early stage.

Producing correct Spanish orthography involves more than simply matching each sound with a letter, however. There are two features in the 12 words used in this study that allow the children to demonstrate knowledge of orthography. The first concerns diphthongized vowels -- vowels that are produced with a degree of tenseness in articulation and require more than a single vowel letter in spelling. The words BAILE, SUEÑO, and MAESTRAS fall into this category as they include adjacent vowels[1]. In addition, the words CALLATE, LEYENDO, and ESTRELLA are viewed as including diphthongized vowels. The graphemes Y and LL have a vocalic quality as they occur at syllable divisions between vowels.

The second spelling feature that permits representing a transitional stage strategy is found in the word SAQUEN which includes a spelling change from the infinitive, SACAR, for the

purpose of maintaining phonetic regularity. In SACAR the letter C represents the "hard" sound, /k/, because it precedes A. It's used in this test sentence as a command, ("...saquen los libros" -- "...take out the books") and the required verb ending is -EN. However, were the word spelled SACEN the letter C when followed by E would be pronouced /s/. In Spanish the spelling is altered to maintain phonetic regularity and the spelling SAQUEN, pronounced "soken," maintains the sound /k/. Thus, the student who spells SAQUEN with a K or Q is viewed as tacitly demonstrating knowledge that goes beyond mere sound mapping. Four points then are awarded for representing the spelling change in SAQUEN with K or Q or for using a second vowel (including Y and LL) when spelling the diphthongized vowels.

These rules do not account for spelling the words VERANO, GENTE, ACERCA, ARROZ, and BRINCANDO as they include neither a diphthongized vowel nor a spelling change. The compromise in these words is that, for four points, all sounds must be accounted for and only one deviation from correct spelling is permitted. Admittedly, achieving a four point spelling in these words requires only good phonemic segmentation, not a visual, or orthographic, strategy. A partial justification for this lies in the literature that reports a progression of difficulty in segmenting increasingly longer spoken words into their individual

phonemes. (Helfgott, 1976; Lewkowicz, 1980; Liberman & Shankweiler, 1979).

This necessarily lengthy rationale for the scoring system is summarized in Figure 1. Figure 2 shows actual student responses to illustrate how the words were spelled for each score.

Insert Figure 2 about here

METHOD

Subjects

The subjects in this study were in kindergarten through second grade in one suburban elementary school in the Midwest. All were limited speakers of English and enrolled in the school's transitional bilingual program where they were receiving their reading instruction in Spanish. The subjects were of Mexican descent and exhibited a wide range of proficiency in their native language. There were 80 subjects (39 boys, 41 girls). Half of the children were in kindergarten (24 boys, 16 girls). 27 were in first grade (12 boys, 15 girls). 13 were second graders (3 boys, 10 girls).

Measures

Developmental spelling test. Twelve words were selected for inclusion in the DST after field testing with first and second grade students who were enrolled in this same program in the year

before the study began. Words were chosen which were judged likely to be in the speaking vocabularies of the kindergarteners while being difficult enough to spell to challenge the second graders. The test words incorporated a variety of spelling features. Some words were chosen to include a one-to-one letter-sound correspondence. Some words included single vowels and some vowel diphthongs. Some were used to include ambiguous consonants (B and V, S and Z).

A DST is administered in a traditional spelling test fashion in which words are pronounced, used in illustrative sentences, and then repronounced. Youngsters who showed any initial reluctance about their ability to produce spellings were encouraged to "spell the words as best you can" and were praised for whatever they did produce.

Word reading. Five words were selected from each of the primer through fifth grade word lists of the Brigance Diagnostic Assessment of Basic Skills -- Spanish Edition (1984). In addition, two words from the spelling list were added to each of the six reading lists for a total of 42 words. Words were presented to students individually in list form. The lists were presented in order of difficulty.

Letter production. Children were directed to write letters as they were named by the teacher. Letters were scored for correct formation only. Upper- versus lower-case were not

considered in scoring, nor were reversals and inversions. Thus, the letter B, for example, was scored as correct if the child wrote b, B, q, p, or d. There were 26 items.

Wordness. The teacher directed the children to the first of 13 sentences on a page and then read that sentence to the children. The children then echo-read the sentence. The teacher read and children echo-read a second time. Then the children were directed to "draw a line around" a target word within each sentence. The first three items were practice sentences used to model the response and give corrective feedback. The ten actual test sentences ranged in length from two to five words each.

Reading comprehension. A measure of reading comprehension was devised by the investigators. Items were selected from the first preprimer through first grade reader levels of the tests which accompanied the basal reading series used at the school. There were 18 items in all.

The task for the two easiest items was to read and select which of three sentences best corresponded to a picture. Short stories of 14 to 24 words in length were used for the remaining items. In a similar fashion children chose which of three sentences best answered questions about the story. While the stories were used as published, most of the answer choices required considerable alteration to reduce the possibility of

finding a single key word from the story and to require reading each of the possible answers in order to make a choice.

Procedures

All tests used in this study, including the experimental DST, are part of the annual end-of-year evaluation battery used at thisschool. Therefore, the tests were administered by the regular classroom teachers (one kindergarten, two first grade, and two second grade) in a whole class setting except for the word reading task which was administered individually. One investigator assisted in administering the DST and the word reading test to the kindergarteners. Due to its experimental nature, the investigators collaborated in scoring the DSTs. All other tests were scored by the classroom teachers.

Data were collected in May of two successive school years. In the first year all subjects (K-2) took the DST and the word reading measure. Only the kindergarteners were given the concept of word and the letter production tests. In the second year the DST and the reading comprehension test were given to the 30 first graders (16 boys, 14 girls) who remained from the original kindergarten population.

RESULTS

Table 1 shows that there is a high and statistically significant relationship between the DST scores and the reading measures. Word reading was the dependent variable of interest

with the kindergarten through second graders in the first year of the study. The correlation between reading and spelling was .85 ($p < .01$). Reading comprehension was the dependent variable of interest in the second year. The correlation between spelling and reading for these first graders was .86 ($p < .01$). The performances of students in these grades on a DST, when scored according to the procedures described in this study, can be interpreted as an indication of reading ability.

Insert Table 1 about here

Part of the evidence for the validity of the Spanish DST is that it parallels the results found in research using an English version of a DST. Morris and Perney (1984) administered a DST in September of first grade and again in January and reported correlations with end of year standardized reading comprehension test scores of .63 and .74 respectively. Similarly, Ferroli and Shanahan (1987) reported a correlation of .67 between a DST administered at the end of kindergarten and the scores on a standardized reading comprehension test at the end of first grade. In the present study, the kindergarten and first grade DST scores correlated .71 and .86 ($p < .01$) respectively with the reading comprehension measure used at the end of first grade. Extending the principles for scoring English DST's to Spanish coupled with

the adaptations described in this study have yielded results that compare quite favorably with those found in studies using similar measures with English speaking populations in the same grades.

This study sought to determine if a DST provides a means for improving the prediction of reading achievement. To that end the DST was administered to kindergarteners in conjunction with a measure of concept of word and a letter production task. Table 1 reveals that, among the measures administered to the kindergarteners, letter production was the best predictor of the reading comprehension score (r = .82 versus .71 for the DST and .62 for concept of word).

The traditional measure of letter knowledge was shown once again to be a very good predictor of subsequent reading ability. However, the DST affords a range of use that cannot be found in a letter knowledge assessment. That is, the letter production test was not administered at the end of first grade as there was little reason to do so. By the end of first grade even the very lowest achieving first graders would have had near perfect scores on letter production. A ceiling effect was assumed. However, this is not the case for the DST. Table 2 shows that the average score of the kindergarteners was 18.4 for the 12 word test. The kindergarteners were consistently representing one to two sounds per word. At the same time the first graders averaged 46.1

points, or just less than four points per word, indicating that the DST was still challenging for the first graders.

Insert Table 2 about here

This is, perhaps, better demonstrated by converting the raw scores to stage ratings. Morris and Perney (1984) reasoned that to convert a raw score to a stage rating the lower boundary of the stage should mean "that, on the average, a minimum of two-thirds of a child's spellings should reflect that conceptual level" (p. 449). The range of scores for each stage rating can be computed for a test of any length by using a simple formula, $NX - N/3$, where N is the number of test items and X is the score for an individual word. For example, a phonetic stage rating (three points for an individual word score) with a 12 item DST yields $12 \times 3 - 12/3 = 32$ as the lowest phonetic stage score. The lowest transitional stage score is $12 \times 4 - 12/3 = 44$. Thus, the phonetic stage scoring range is 32 to 43 points. Table 3 shows more clearly that the kindergarten scores did not cluster at the preliterate stage nor did the first graders' scores cluster at the correct stage. Although the DST does not improve upon the predictive ability of a test of letter knowledge, it does offer an assessment that discriminates among students of various ability as

early as kindergarten and continues to be sensitive to the full range of abilities found among students at the end of first grade.

Insert Table 3 about here

Converting raw scores to stage ratings further shows that DST scores can be used to document students' growth in fairly small increments. Table 4 reveals that of the subjects who took the DST both in kindergarten and at the end of first grade 70 percent advanced across two or more spelling stages in the course of one school year. It seems reasonable to conclude that a first grade teacher could use a DST at six or even three month intervals as a means of documenting and monitoring rather small amounts of student growth in word knowledge.

Insert Table 4 about here

Reliability of the Scoring System

The conceptual basis of developmental spelling stages implies that a child who produces a phonetic stage spelling for one word should do the same on most words. If that is so, then each word used in the Spanish DST should tap into the same sort of spelling strategy. The Spanish DST was found to yield an extremely high degree of internal consistency (Cronbach's alpha). The

coefficient for the first year (n = 80) was .98 and for the second year (n = 30) was .95. This high degree of internal consistency is interpreted as supporting the underlying construct of developmental spelling stages.

It was important to determine the ease with which the scoring system could be learned if the Spanish DST is to have practical use for teachers. Four teachers (two first grade and two second grade) from the bilingual program at the subjects' school were asked to participate in order to determine how easily the scoring system could be learned. All training for these teachers was conducted in one forty minute school lunch period. There was no discussion nor further training beyond this single session. Each teacher scored eight protocols so that 32 of the original 80 were used. The scorers agreed with the investigators' scoring on 92 percent of the individual word scores. The result was an inter-rater reliability correlation coefficient of .99, $p < .01$. In one short session the scoring system was learned successfully.

The DST is intended to allow children to demonstrate a full range of spelling strategies. That is, the scores from a kindergarten through second grade sample should be widely distributed across the zero to five point scale. It was found that from the 960 individual word spellings collected in the first year of the study 13 percent of the scores reflected preliterate stage word knowledge (zero points), 12 percent received one point

and 17 percent two points (semiphonetic1 and semiphonetic stages), 25 percent received three points, 14 percent four points, and 20 percent were correct. While the actual scores are not evenly distributed across the range of possible scores, $^2(5, N = 960) = 68.99$, $p<.01$, there is, nevertheless, a good deal of dispersion. No score was assigned more than 25 percent nor less than 12 percent of the time.

Confirmations of the Scoring System

The results reported thus far confirm that the general procedures used for scoring DST's in English can indeed be extended to Spanish. At the same time it was necessary to change some elements of the scoring system. Both Hudelson (1981-82) and Temple (1979) suggested that children's spelling in Spanish showed greater vowel consistency and more consonant ambiguity. The scoring of the Spanish DST accounts for the greater salience of vowels in the following ways: vowels were given equal weight to consonants in scoring from the earliest spelling stages, vowels had to be correct -- there were no logical vowel substitutions permitted as there are in English, and a phonetic map of a word (three point spelling) was defined as representing the correct vowel of every syllable.

The information in Table 5 supports viewing vowels as an early emerging and consistent feature of children's spelling in Spanish. The spellings of the vowels and consonants are reported

for the children who are just beginning to establish letter-sound knowledge (kindergarteners at the semiphonetic stage) in contrast to the spellings of children who have a solid grasp on letter-sounds (first graders at the transitional stage). Among the semiphonetic spellers, the vowel spellings were correct 92% of the time and none of these kindergarteners used a wrong vowel. The transitional stage children spelled the first letter of the vowel words correctly in every case. These findings support a scoring system that requires vowels to be correct at even the earliest stages.

Insert Table 5 about here

Consonant spellings are much more diverse. The kindergarteners were able to correctly spell the first letter of the consonant words only a little better than half of the time, and their errors were of several kinds. By contrast, the transitional stage spellers used the correct consonant much more often, and the incorrect spellings seemed to be limited to the logical substitutions. (Figure 1 lists the ambiguous consonants that are considered acceptable.) These response patterns support a scoring system that assigns the highest number of points to a correct consonant spelling, fewer points to an acceptable substitution, and the fewest to a spelling that is neither correct

nor acceptable. These findings on the relative salience of consonants and vowels suggest that the specific ways the English scoring system was modified for scoring Spanish words were consistent with the spellings the children actually produced.

DISCUSSION

The purpose of this study was to create and validate a DST that could provide teachers in transitional bilingual programs where reading instruction is first delivered in Spanish with a means for predicting and measuring the Spanish language reading ability of students in kindergarten and first grade. The results reported show that the Spanish DST is such an indicator of reading ability.

The early emphasis on vowel correctness represents a dramatic departure from what is expected from young children's spellings in English. Yet the results were very similar to those found in the literature on DST's in English. Thus, it is concluded, first, that there are indeed some generalized principles in spelling in alphabetic languages and, second, that the modifications used to score words in Spanish were in fact consistent with developmental spelling theory.

The DST has the potential for being of practical use to teachers. It is group administered, easily learned, and sensitive to the abilities of prereaders through first and even some second graders. It also provides the teacher with a means to determine

and document growth in small amounts as children take initial steps toward acquiring literacy.

Validating the DST leads to instructional implications. Individual spellings are evaluated according to the stages of development they reflect. Stage ratings conceptualize scores as indications of the strategies children use when they spell. This developmental perspective, in turn, provides a diagnostic framework in which teachers can analyze spelling errors and infer the strategy that a child uses. Teachers might use such information in placement and grouping decisions. Further, the scoring system sets up a structure for looking at children's spelling in naturally occuring text. Recognizing what children know about how words are spelled can tell teachers what might be expected and accepted in early writing efforts. Instruction might be planned for preliterate stage spellers, for example, that promotes print awareness and letter knowledge. Semiphonetic stage spellers might be provided with the letter-sound instruction for which they are demonstrating awareness and ability. Transitional stage spellers are likely ready for instruction in silent letters, structural elements, and other spelling features that go beyond the simple sound-for-sound encoding of spoken words characteristic of phonetic stage spellers.

Further research with the Spanish DST is needed with other populations. Hispanic communities in the United States vary in

the degree to which they are isolated from or integrated with English speaking communities. Although Read's (1971) early work with a small and exceptional sample was later confirmed in other English speaking communities, it seems possible that Hispanic students might differ from one community to another in their performance on a DST.

As Hispanic communities in the U.S. differ, so, too, do programs that seek to meet their needs. It seems likely that students in schools that employ different program models might perform differently. Future research might use a DST as part of a means to identify how the nature of instruction within the various programs impacts differently on children's spelling strategies.

Validating the Spanish DST makes a contribution to the research and knowledge basis relating to issues of transitional reading and writing curricula. An especially intriguing direction for further research would be to employ DST's in both languages with the same subjects. Investigations along this line could contribute to understanding how literacy acquisition in one language interacts with literacy acquisition in a second language. The elusive question of what is the optimal point at which to transition second language students into English reading might be partially answered by such research.

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Footnote

[1] Technically, the word 'maestras' does not include a diphthong as the E is the vowel nucleus of its own separate syllable. However, as the vowels in these two syllables are adjacent and not interrupted by a consonant sound, it is justified to score and interpret the AE spelling feature according to the provisions for true diphthongs.

Table 1

Intercorrelations Among All Measures

Measures	1	2	3	4	5	6
First Year						
1. Letter Production	---	.59	.80	.51	.79	.82
2. Concept of Word		---	.69	.43	.64	.62
3. DST Year 1			---	.85	.67	.71
4. Word Reading				---	.31*	.34*
Second Year						
5. DST Year 2					---	.85
6. Reading Comprehension						---

* $p < .05$; all other correlations $p < .01$

Table 2

Means and Standard Deviations

	First Year				Second Year
	All	Kdg	1st	2nd	1st Grade
Spelling					
n	80	40	27	13	30
mean	32.6	18.4	46.1	48.2	43.1
SD	17.4	12.1	5.2	10.0	12.5
Word Reading					
n	80	40	27	13	
mean	16.8	2.9	28.6	35.2	
SD	17.1	5.8	13.5	10.0	
Letter Writing					
n		38			
mean		18.7			
SD		5.2			
Wordness					
n		38			
mean		9.9			
SD		3.2			
Reading Comp.					
n					31
mean					10.3
SD					4.3

Table 3

Percent of Students at Each Spelling Stage -- First Year

	Developmental Spelling Stage					
Grade	Pre-lit	Semi-Phon 1	Semi-Phon 2	Phon-etic	Trans-ition	Corr-ect
Kindergarten (n=40)	20	35	28	15	3	
First Grade (n=27)				26	74	
Second Grade (n=13)		8		8	77	8
All (n=80)	10	19	14	18	39	1

Table 4

Movement Across Spelling Stages from Kindergarten to First Grade

		First Grade					
Kindergarten		Pre	S1	S2	Ph	T/C	Tot
Preliterate	(Pre)	1	1	1	3		6
Semiphonetic1	(S1)			2	3	5	10
Semiphonetic2	(S2)				1	9	10
Phonetic	(Ph)					3	3
Transitional/Correct	(T/C)					1	1
Total		1	1	3	7	18	30

Table 5

Consonant and Vowel Spellings of Semiphonetic Versus Transitional Stage Spellers

	How the First Letter Was Spelled				
	Correct C/V	Acceptable Substitute	Other C/V	Omitted	No Response
Semiphonetic					
Consonants	56	17	12	10	5
Vowels	92	a	0	7	1
Transitional					
Consonants	88	11	1	0	0
Vowels	100	a	0	0	0

N = 29 for the kindergarten semiphonetic spellers

N = 12 for the first grade transitional spellers

a - The scoring procedures accept no vowel substitutions.

Figure 1

Spanish DST Scoring Criteria

0 points -- A "preliterate" spelling is one in which there is no letter-sound relationship between the sounds in the first syllable and the first symbol written (saquen = OIT).

1 point -- In a "semiphonetic1" spelling the first letter written represents* EITHER the first consonant or the first vowel (gente = GR or ER; estrella = EIU or SA).

2 points -- A "semiphonetic2" spelling represents

a) the initial consonant and another consonant in the target word (brincando = BCN), or

b) the initial consonant and the first vowel (sueno = SUE), or

c) the initial vowel and one consonant (estrella = ESAH).

3 points -- A "phonetic" speller produces the vowel in each syllable. No vowel substitutions are accepted. In single vowel cases, the vowels have to spelled correctly (brincando = BINADO). Vowel pairs may be accounted for by correctly spelling either letter of the vowel pair (baile = BILE; sueno = SUNO).

4 points -- In "transitional" stage spellings every sound must be accounted for (gente = JENTE; brincando = BRINKANDO). One deviation from correct spelling is permitted so long as no sound is omitted (JENTE = 4, but GETE or JETE = 3). Diphthongized vowels must be "marked" by using two consecutive vowels or one vowel followed by Y, LL or ~. The spelling of SAQUEN maintains the /k/ sound with a K or Q between the vowels.

5 points -- correct.

* Ambiguous consonant letters, while incorrect, are accepted as "representing" the target sound. B and V may be interchanged as may: J and G; C, S, and Z; C, K and Q; LL and Y, and RR and R.

Figure 2

DST Protocols Illustrating Each Score

Word	0 Points	1 Point	2 Points	3 Points	4 Points
VERANO	Hapo	BPLA	VRNO	beao	berano
GENTE	8	Gr	gtet	GETE	jente
BAILE	SDe	Vn	BLE	bale	valle
SUENO	no	SMT	SUE	seNNo	cuenllo
ACERCA	rar	AoPTR	ACOR	aseca	aserca
ARROZ	vAu	AotRt	arei	aros	arros
CALLATE	eTe	At	calete	KALATE	calate
SAQUEN	olt	SeeA	cacn	sacen	saken
LEYENDO	lLl	L	LecN	leendo	leleNDO
BRINCANDO	E	BLR	BCN	lao	brincanbo
MAESTRAS	StoE	eM	MA	marta	maestrac
ESTRELLA	VX	Elu	esah	esreya	estrela